

Dani owner's manual

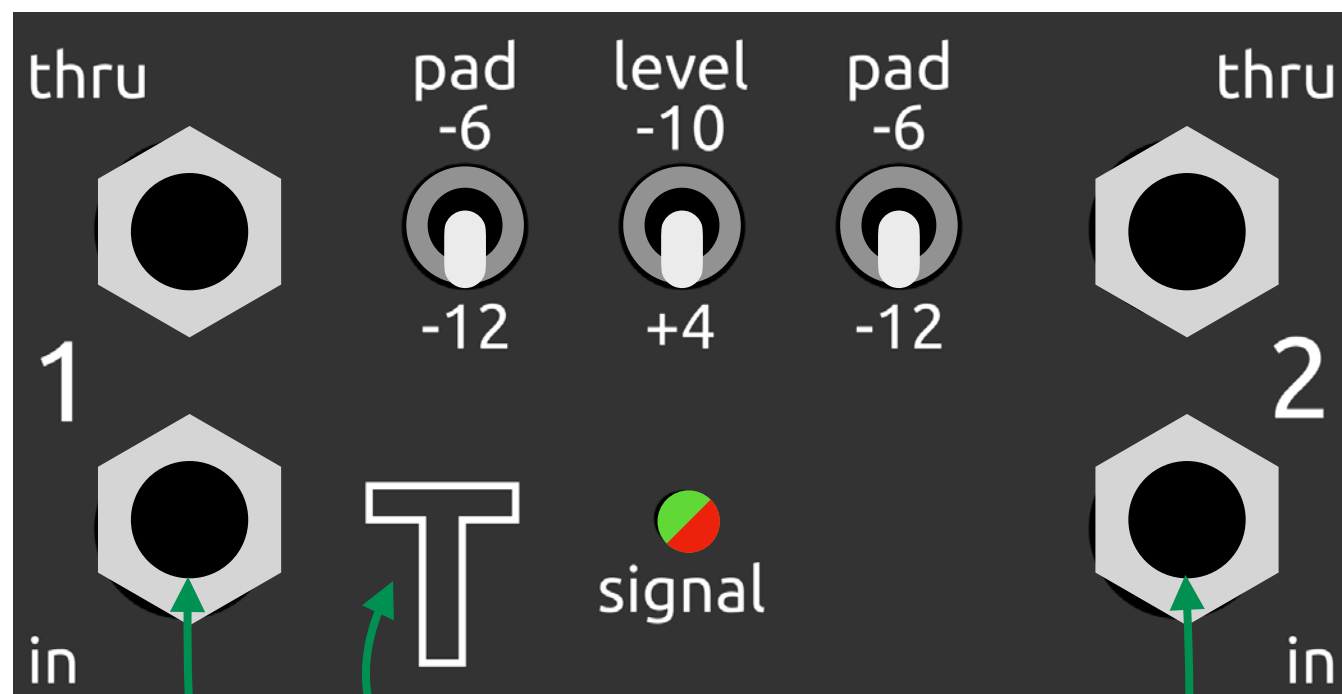


**SKAA[®] Pro wireless audio transmitter
by Dillinger Labs**

April 14, 2021

The Front Panel





the bigass "T" is a handy reminder that Dani is a transmitter (sender) of wireless audio

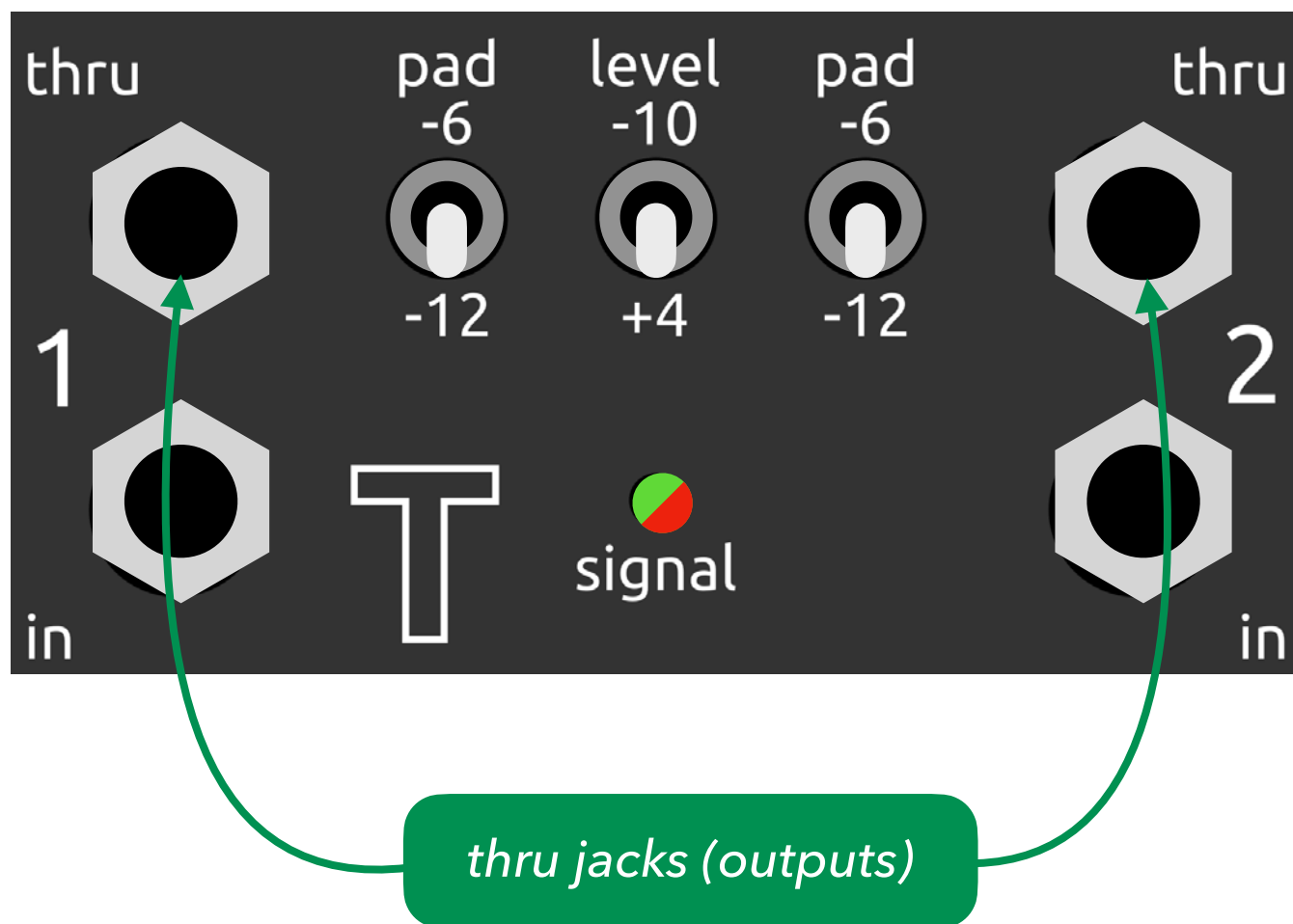
2 inputs

** To learn how to use one Dani to handle BOTH front of house and headphone cue mix, check out the hookup diagrams at the end of this manual*

TIP: if one channel sounds louder than the other, make sure your pads are set the same – also make sure you're using the same type of cabling (TRS balanced or TS unbalanced) for both

INPUT JACKS on the front panel

- These are balanced / unbalanced ¼" TRS "line level" inputs with input impedance greater than 20 k ohms
- Inputs 1 & 2 are most commonly used for Left and Right audio respectively ... but they can be used for anything you want
- For example, you can send your FOH (front of house) mix on channel 1 and your headphone cue mix on channel 2 *
- These inputs are capable of handling +24 dBu of signal (super hot!) without breaking a sweat – just engage the pads if needed
- So ... you don't have to back off your mixer output to feed Dani – crank it up !
- Have XLR outputs on your mixer or DJ controller? Perfect - use XLR to ¼" TRS cables to go into Dani with balanced signal – this is THE best way because the signal is strongest and the noise is lowest
- What's on the other side of those jacks? Real Burr Brown input buffers, followed by real Burr Brown analog to digital converters – yep, for you, only the best !
- Got RCA outputs on your mixer? No problem – Dani's inputs will happily accept unbalanced signals, too
- With an RCA source you can use a standard stereo RCA cable to make your connection – just pop a pair of ¼" TS to RCA adapters into Dani's inputs and use a stereo RCA cable (if you're like me, you have a drawer full of them) to connect your device to Dani
- SKAAstore.com has these adapters and also has a great stereo ¼" to RCA cable if you want a one-piece cable
- Of course ¼" sources (both balanced TRS and unbalanced TS) work great with Dani, too
- Want to feed Dani from a 3.5 mm headphone jack? From a phone or a computer say? No problem – just use a 3.5mm to 2 x ¼" TS cable and you're in business



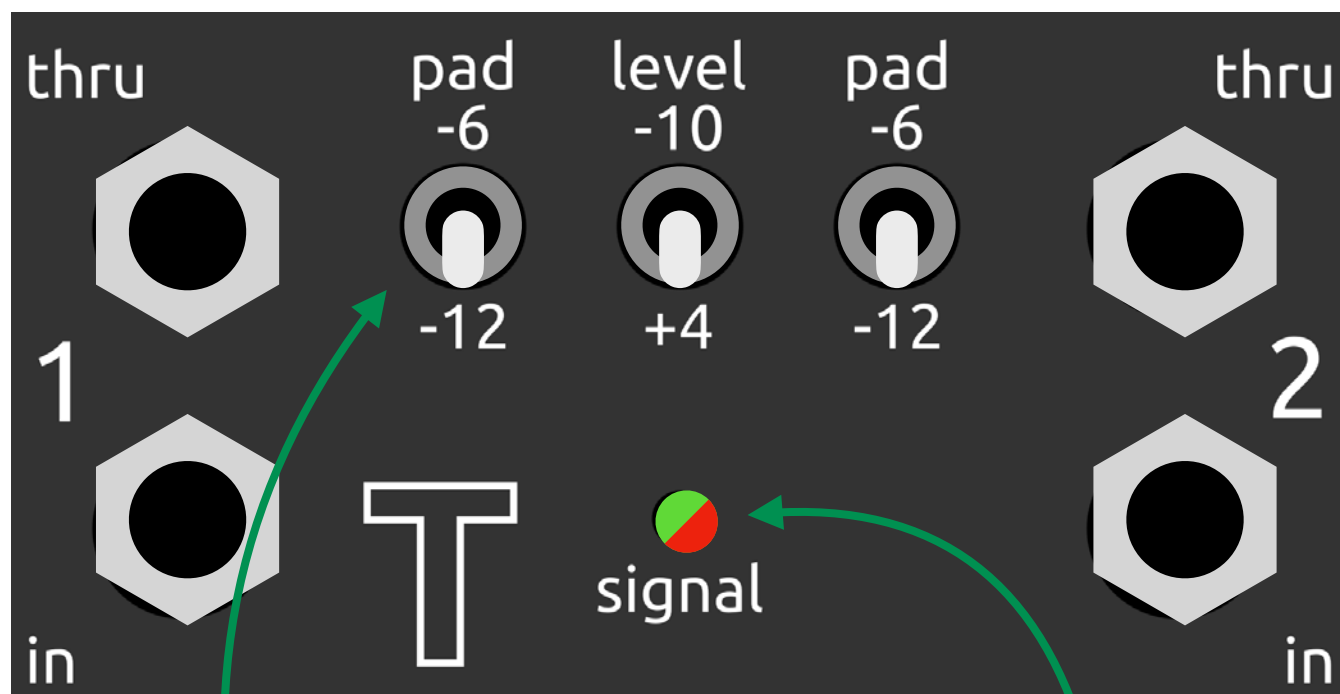
THRU JACKS on the front panel

- The Thru jacks are outputs wired in parallel with the inputs so you can route your signals to the next device in addition to transmitting it out wirelessly via SKAA® or SKAA Pro™
- Thru 1 is for Channel 1 audio, Thru 2 is for Channel 2 audio
- The Thru jacks only work if something is already plugged into their respective input jack
- If a balanced signal (TRS ¼" plug) is present in Input 1, the same balanced signal will be available as an output on Thru 1 – and likewise for Input 2 / Thru 2
- If an unbalanced signal (TS ¼" plug) is present in Input 1, the same unbalanced signal will be available as an output on Thru 1 – and likewise for Input 2 / Thru 2
- Don't worry, neither Dani's pads nor its volume knob will affect the output level on the Thru jacks
- One common use for the Thru jacks is when you are running a hybrid system – you might run wired amps / speakers for the front of the room and wireless speakers for the back of the room ... so the output of your mixer goes to Dani's Input 1&2 and the Thru 1&2 outputs go to your amps
- Another common use for these is when you want to run 2 Dani Transmitters at the same time (say you want to double your wireless speakers for a gig) – so connect your mixer out to Dani A's inputs and run patch cables from Dani A's thrus to Dani B's inputs ...
- ... use XLR to TRS balanced cabling for the first hop and TRS to TRS balanced cabling for the 2nd hop if you want the best sound possible *
- Tip: if you've gone to the trouble of feeding Dani properly with balanced (TRS) signals, don't then plug unbalanced (TS) cabling into your Thrus – it will unbalance your inputs and cut your signal level in half – use TRS cables in your Thrus instead
- Tip: if your source is just 1 channel, you could connect Thru 1 to Input 2 and that would send it out on both SKAA channels

** check out how to use two Dani transmitters in the hookup diagrams at the end of this manual*

Pro Tip: if you're stuck for cables and you've got no choice but to feed one channel balanced and the other unbalanced, you might end up with one channel 6 dB louder than the other. If you do, you can even them out by padding the balanced channel by 6 dB more than the unbalanced one.

*Need audio cables or adapters?
SKAAstore.com has what you need !*



3 input toggles

pads are OFF in the center position

use the pads to make sure the signal LED only flashes red very rarely - green most of the time is what you want to see

signal / peak LED

Tip: to turn off the green flashing of the signal LED, click the volume knob on the rear panel (it's a button, too). The signal LED will then display red only (it will show peaks only). Click again to get green back. Green is always enabled when you power on your Dani.

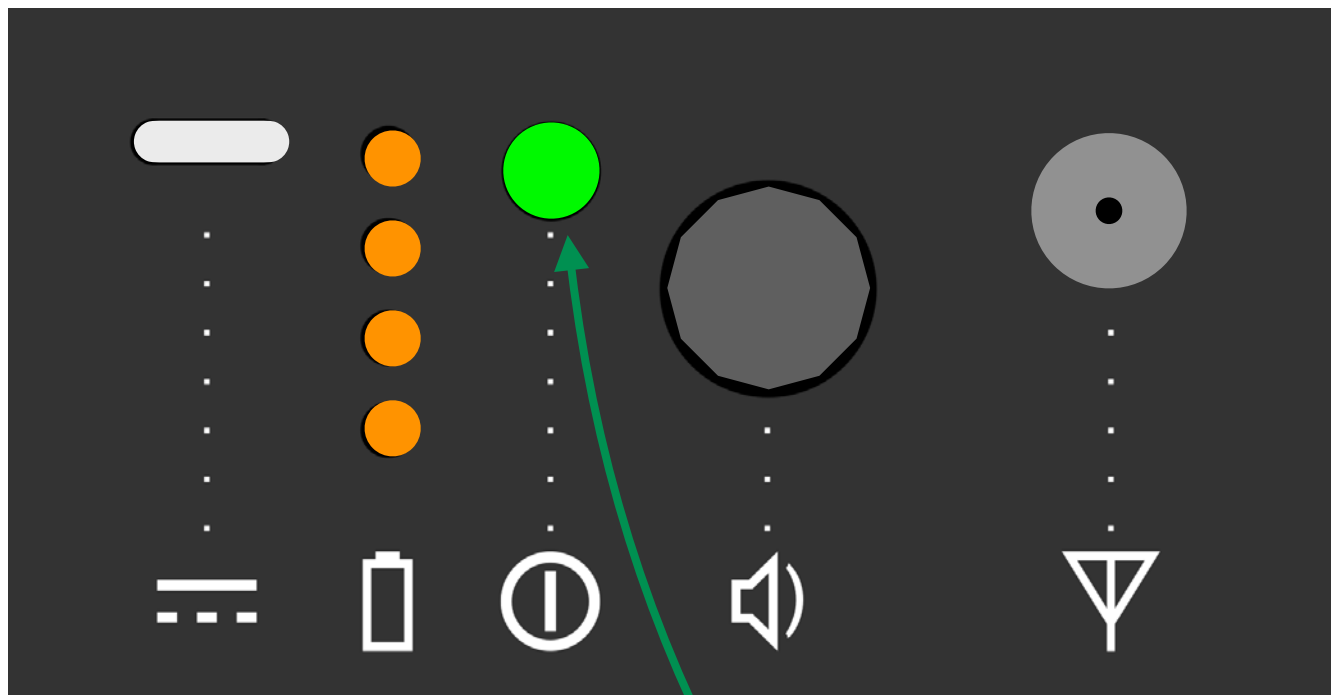
Pro Tip: try setting all 3 toggles in the down position and turn your mixer up !

INPUT TOGGLES & SIGNAL LED on the front panel

- Dani can handle a wide range of “line level” signals from the wimpy to the extreme
- Start with the 2 pad switches in the middle position (all pads OFF)
- Next, set the level toggle switch – the one in the center of Dani’s front panel – set it up in the -10 dBV position for consumer source devices (for example phones, computers, iPads, etc.); set it down in the +4 dBu position for pro source devices (mixers, DJ decks, keyboards, electronic drums, etc.)
- Connect your source device to inputs 1&2 and play a loud song – turn up the volume on your audio source device nice and high – somewhere between 90% and 100% volume level will usually deliver the best results
- Now have a look at the Signal LED – it will flash green along with the music when there is signal flowing into Dani and red when the signal is close to clipping
- If the Signal LED flashes green all the time or if it flashes red very rarely, you’re good to go
- If you see the Signal LED flashing red quite a lot, try setting the 2 pad switches to -6 dB. If the red goes away or happens very infrequently, you’re good to go
- If you have a super hot source, you can try backing off the output level of the source device – or just set the pads at -12 dB to calm down the Signal LED
- The Signal LED flashes red (“peak”) when the signal gets to within 3dB of clipping (clipping = distortion = bad !)
- Tip: If you want to use Dani with a microphone source, you’ll need a pre-amp in between the microphone and Dani to increase the signal level from “mic level” to “line level” - most DJ decks and all mixers have this “preamp” function
- Tip: Dani’s inputs don’t have the correct impedance for electric guitar / bass – but putting most any guitar pedal in-between your guitar and Dani will fix that problem ;-)

The Rear Panel



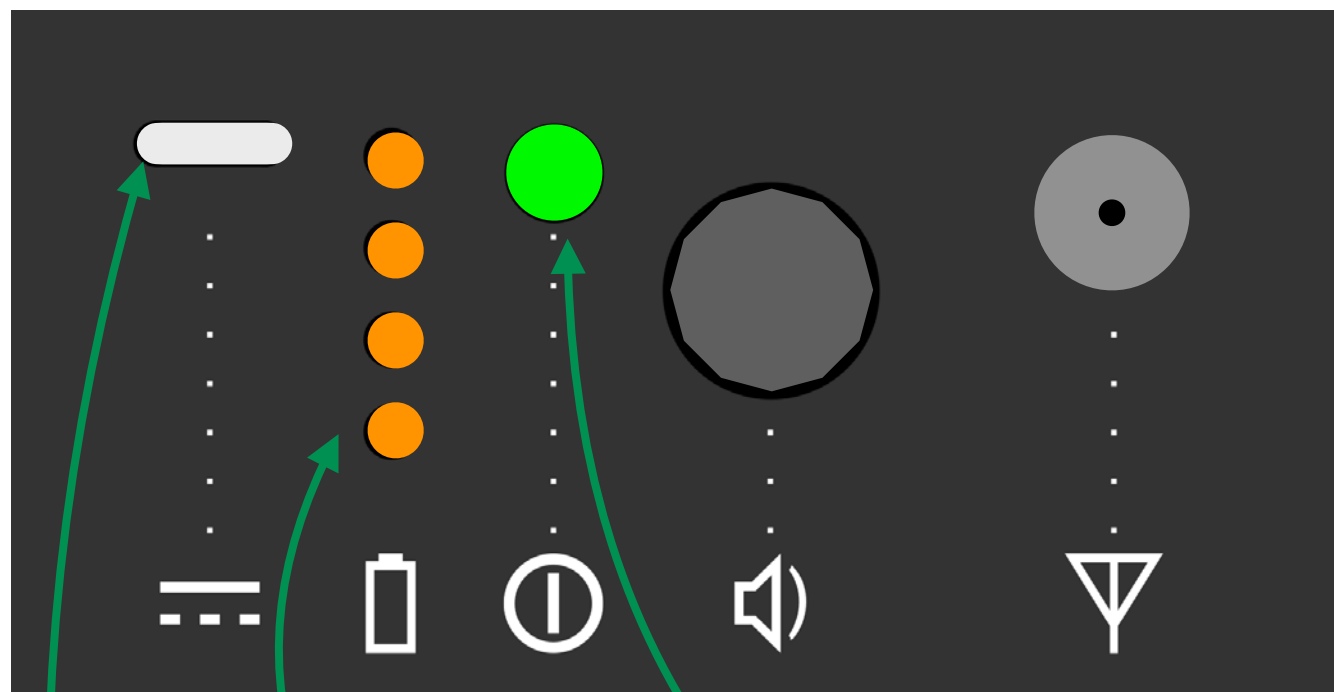


hold the power button for a few seconds to turn Dani on / off

when power is on, triple click (click 3 times, fast) the power button to toggle between SKAA (green) and SKAA Pro (red) modes

POWER and SKAA® MODES on the rear panel

- Power Dani on / off by holding the power button down for a few seconds
- When powered on, you can change Dani's operational mode by triple clicking the power button (click 3 times, fast)
- A Green glowing power button means that Dani is powered on in SKAA mode
- In this mode, Dani will serve up to 4 SKAA receivers at 36 ms of latency
- A Red glowing power button means that Dani is powered on in SKAA Pro mode
- In this mode, Dani will serve up to 2 SKAA receivers at 19 ms of latency
- Note that SKAA receivers, such as the New Soundboks speakers, Dillinger Labs Helix headphones and Dillinger Labs Aquarius speakers are compatible with both SKAA and SKAA Pro operation – they will automatically kick into whichever mode Dani is in when they Bond to Dani
- When in SKAA mode (Green power button), Dani will power off its radio transmitter (which will drop Bond to all downstream receivers) after 2.5 minutes of no audio (silence) on its inputs – if it's operating from its battery, Dani will automatically power itself off 60 minutes later
- When in SKAA Pro mode (Red power button), Dani will power off its radio transmitter (which will drop Bond to all downstream receivers) after 20 minutes of no audio (silence) on its inputs – if it's operating from its battery, Dani will automatically power itself off 60 minutes later



Battery Life Indicator

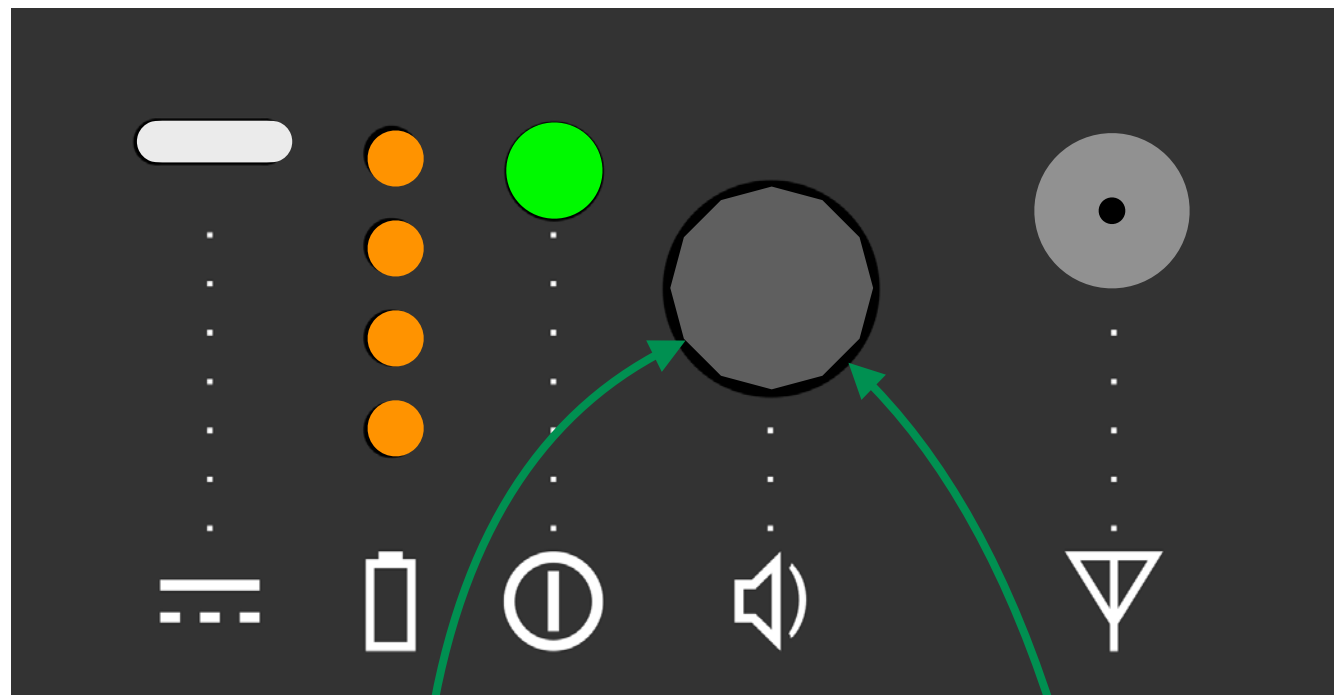
while Dani is powered on, click the power button once to display the remaining battery life

Type C power jack – use the included A to C cable with a USB power adapters to charge your Dani – keep in mind, this jack is for POWER ONLY – if you plug Dani into your computer, nothing magical will happen other than Dani's battery will become fuller !

BATTERY LIFE and CHARGING on the rear panel

- Dani will run for 14 hours from a full charge, using its internal battery
- Virtually any 5V USB power adapter, such as an ordinary mobile phone charger, will charge your Dani
- Charge Dani by connecting a USB power adapter using the Type A to Type C cable that's included with your Dani
- Charge time depends on the current supply capability of your USB power adapter – Dani is capable of fast charge if your adapter can supply at least 2 Amps
- Dani's battery will charge in 2 hours (from fully depleted) – longer if your USB Power Adapter can't do at least 2 Amps
- Dani will also happily transmit wireless audio while you're charging its battery
- To find out how much battery life remains: make sure Dani is powered on (the power button must be glowing either red or green) – then click the power button once to activate the Battery Life Indicator (the stack of 4 orange LEDs)
- The Battery Life Indicator gives you a visual indication of the amount of energy remaining in the battery – it stays on for a few seconds and then will automatically shut off
- When there is about 45 min of operating time remaining, the bottom LED in the stack will start to flash slowly (the one right beside the battery icon) – no click on the power button is necessary to see this "low battery" flashing state
- Dani will auto power off when the battery is fully depleted
- When Dani's battery is charging, the top LED in the stack (the one right beside the Type C connector) will glow – even if Dani is powered off
- When Dani is done charging (when the battery is full), the top LED in the stack will turn off
- You can replace Dani's 18650 battery cell if say, several years down the road, the battery is showing its age – remove 2 screws and you have access – do so only if you're "handy" ...

GLOBAL VOLUME and MUTE on the rear panel



turn clockwise to turn volume up, counter clockwise to turn it down - you're actually remote controlling the amp gain in all the Bonded speakers !

Triple click to mute / unmute all Bonded receivers

Tip: here's the cowboy way to control volume: set your mixer / deck's output level nice and high and then LEAVE IT ALONE ... if necessary, set the pads on DANI so the Signal LED is flashing red only rarely – mostly green is what you want to see – then when you want to tweak your wireless speaker levels up or down, use the volume knob on Dani (DON'T use the fader on your deck / mixer). This trick will get you the best audio quality possible and you won't clip.

- Dani has a global volume control knob which doubles as a mute / unmute button
- This knob can be turned clockwise to turn all Bonded receivers up and counter clockwise to turn all Bonded receivers down
- Keep in mind the the local volume controls (for example that big knob on the New Soundboks) are still functional, too – for individual trim of each separate speaker
- Use the global volume on the Dani to control the overall volume of the system (affects all Bonded receivers) and use the local volume on the speakers to fine tune the balance between them
- It's a good idea to start with Dani turned down and all the Bonded speakers turned all the way up – then bring up the global volume on Dani to the desired level. Then, if needed, tweak down some of the speakers (using the volume on the speaker itself) if some of those speakers are too dominant in the room
- SKAA handles volume control using a separate data path so Dani always transmits full-scale audio; we do it this way so the audio quality stays excellent regardless of the volume level
- The volume scaling of the audio actually happens in the amplifiers of the speakers themselves, NOT in Dani – when you twist Dani's volume knob, you're actually remote controlling the gain of the amps in the Bonded speakers / receivers !
- Watch the Bond Indicators of the downstream speakers / headphones flash as you turn Dani's volume knob – this flashing indicates that the volume data is flowing in and controlling the amplifiers' gain in those devices
- Triple click (click 3 times, fast) Dani's volume knob to mute all Bonded downstream speakers – do it again to unmute them
- Note you can still also mute / unmute Bonded speakers one at a time by triple clicking their SKAA Bond Buttons
- Dani's Volume knob does NOT affect Thru jack output levels



*standard SMA
antenna stud*

*included 2 dBi
antenna*

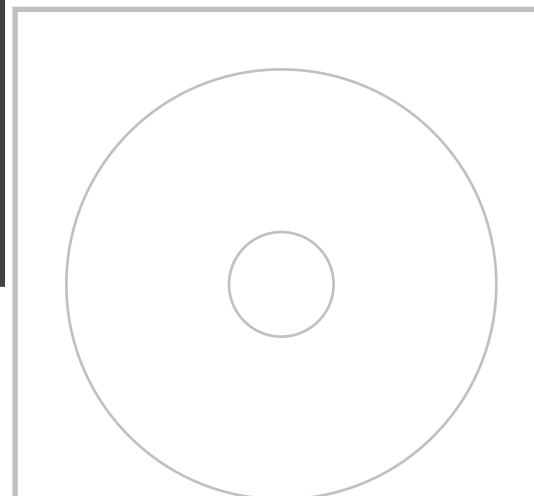
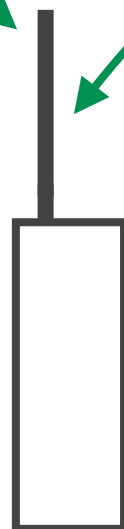
*point the antenna
straight up for
longest range*

*antenna is above
the speaker grill*



Dani on a table top

Dani velcro'd to
a tall speaker



ANTENNA stud on the rear panel

- Dani is capable of up to 50 meter reliable range with the included +2 dBi screw-on 2.4GHz SMA-type antenna
- Your actual reliable range will also depend on how well the antenna is implemented in the receive-side device
- Higher gain antennas (for example +5 dBi) can also be used with Dani to extend range if desired (to around 80 meters) – just be sure to do this only if +22 dBm transmissions are legal where you're operating so you don't end up in the state penitentiary
- Dani's antenna can be removed by unscrewing it – do this to protect Dani from damage during transport, just like you should always unplug the audio cables – get into the habit of removing the antenna before tossing Dani into your gig bag
- The SMA stud, as well as switches, buttons, indicators and jacks, are all protected by the protruding surround of Dani's enclosure – but for sure you still need to remove the antenna for transport and not doing so may void your warranty
- Normally you should orient the antenna vertically (point it straight up) – see the diagrams on the bottom left
- For best results, get Dani, and therefore its antenna, elevated as high as possible – to achieve really long distances, get the antenna high enough so the wireless can shoot over the heads of the people in the crowd
- If you've velcro'd Dani to a vertical surface such as one of your front-of-house speakers, bend the antenna so it's pointed straight up and make sure the antenna clears the speaker grill – in other words, make sure the entire length of the antenna is above the top of the metal grill of the speaker – see the diagram to the left
- If you're using 2 Danis in your setup, separate them from each other by at least 1.5 meters – if you're not getting good performance, orient the antennas so they're both at 45 degrees from vertical, and 90 degrees to each other

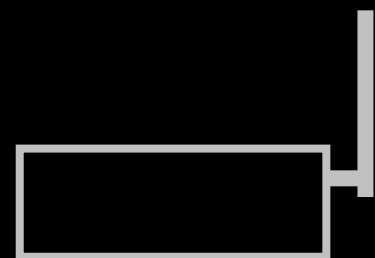
Parameter	Conditions	Value
Inputs		2 x ¼" TRS Balanced or TS Unbalanced
Thrus		2 x ¼" TRS wired in parallel to each respective input
Input Impedance	Line-GND, Balanced or Unbalanced	> 20 kΩ
Qty. Discrete Audio Channels		2
Standard Compatibility	SKAA OS 2.1 and later	Any SKAA speakers, SKAA headphones, SKAA receivers
Input Pads (Each Channel)		0 dB, -6 dB, -12 dB, user selectable
Max Input Level (0 dB FS)	Level -10, No pad, <0.1% THD+N, 997 Hz	1 V rms
Max Input Level (0 dB FS)	Level -10, -12 dB pad, <0.1% THD+N, 997 Hz	4 V rms
Max Input Level (0 dB FS)	Level +4, No pad, <0.1% THD+N, 997 Hz	+12 dBu
Max Input Level (0 dB FS)	Level +4, -12 dB pad, <0.1% THD+N, 997 Hz	+24 dBu
Signal LED Thresholds	Reference: 0 dB FS at the ADC input	Green: -20 dB, Red: -3 dB, of the greater of chan 1&2
Frequency Response	Reference: 997 Hz @ 0 dB FS	20 Hz - 20 kHz, + / - 0.3 dB
THD+N	-1 dB FS, 20 Hz -20 kHz, 24 kHz BW	<0.03%
SNR Unweighted	997 Hz @ 0 dB FS, 24 kHz BW	>91 dB
SNR A-weighted	997 Hz @ 0 dB FS, 24 kHz BW	>94 dB
Crosstalk, Unbalanced	Channel to Channel, 0 dB FS, 20 Hz -20 kHz	>58 dB
Crosstalk, Balanced	Channel to Channel, 0 dB FS, 20 Hz -20 kHz	>66 dB
Digital Resolution		48 kSamples / second, 16 bit, each channel
SKAA Transport Latency	I2S digital to I2S digital	36.72 ms, + / - 1.5 samples
SKAA Max Qty. Receivers	Concurrently Bonded	4
SKAA Pro Transport Latency	I2S Digital to I2S Digital	19.39 ms, + / - 1.5 samples
SKAA Pro Max Qty. Receivers	Concurrently Bonded	2



**the Sweet
Hookups**

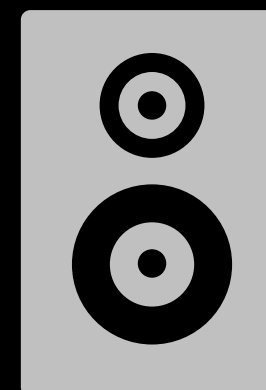
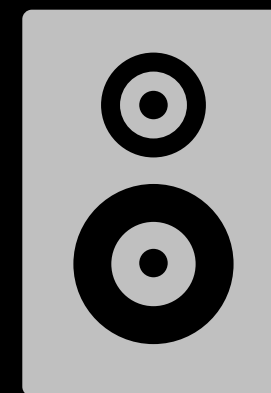
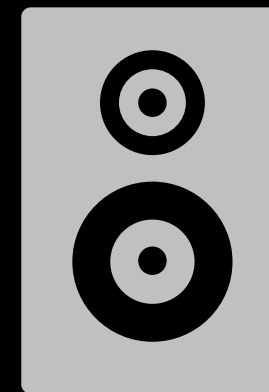
*Need audio cables
or adapters?
SKAAstore.com has
what you need !*

One **SKAA** cell



Dani transmitter
in SKAA mode
(connected to audio source)

36 milliseconds



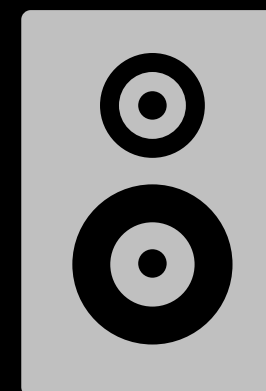
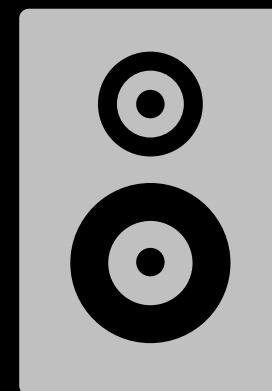
the 4 receivers can
be any combination
of SKAA speakers,
SKAA headphones,
and SKAA receivers



One **SKAA Pro** cell



Dani transmitter
in SKAA Pro mode
(connected to audio source)



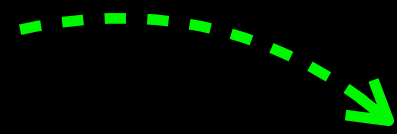
19 milliseconds

the 2 receivers can
be any combination
of SKAA speakers,
SKAA headphones,
and SKAA receivers

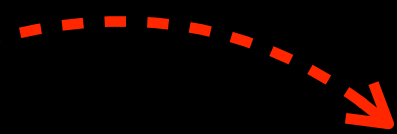


All SKAA receivers work in both SKAA and SKAA Pro
modes – mode is determined by the transmitter class

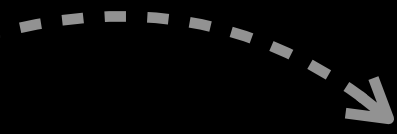
LEGEND



SKAA



SKAA Pro



WiFi



Wire



1

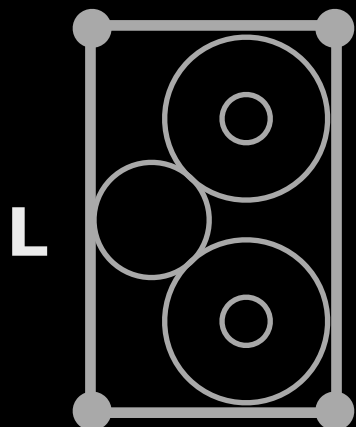
Hi Fidelity Party



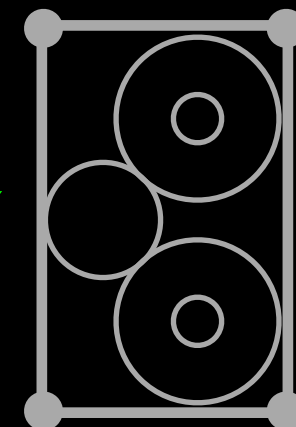
streaming music



Dani

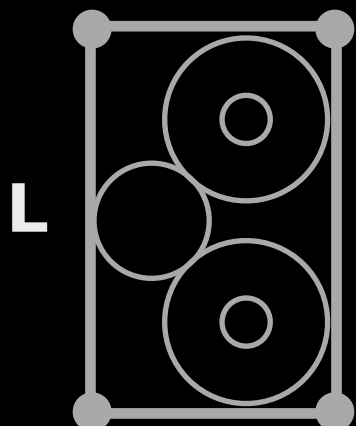


SKAA Speaker

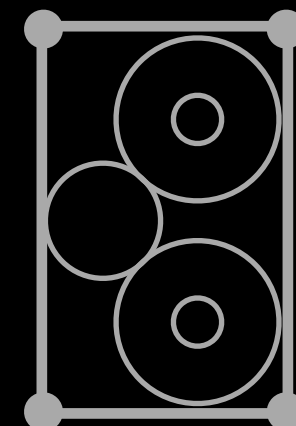


SKAA Speaker

SKAA Speaker



SKAA Speaker

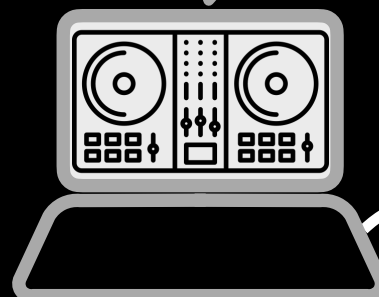


Pump up the fidelity by keeping Bluetooth out of the signal chain. Just use computer, tablet or phone with a Spotify account

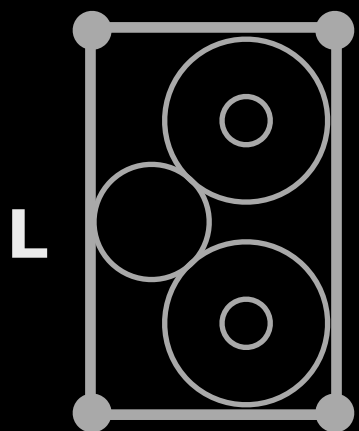
2

Keep it Simple DJ Party

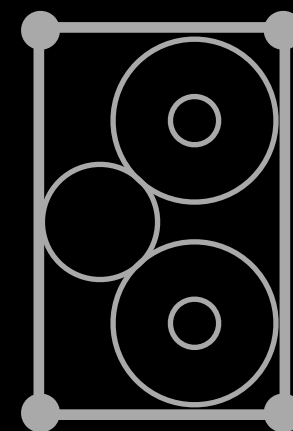
DJ Music Service
BPM Supreme etc.



Dani

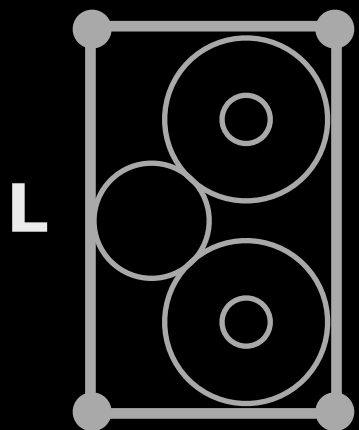


SKAA Speaker

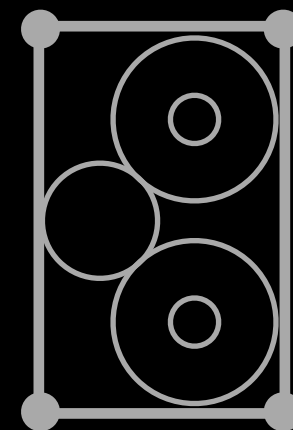


SKAA Speaker

SKAA Speaker



SKAA Speaker



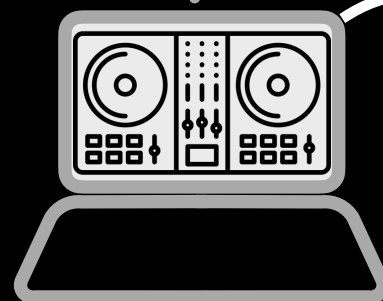
Serato and others have "mixer free" DJ solutions (software and laptop only) so this setup is ideal for DJs who want a light-weight rig which is easy to set up

3

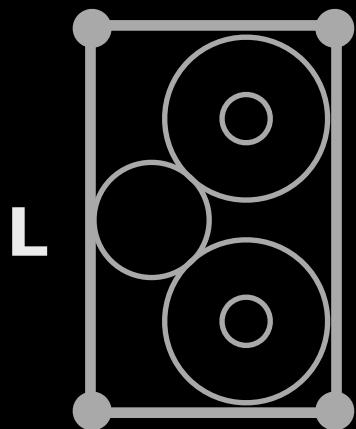
Serious DJ Party



**DJ Music Service
BPM Supreme etc.**

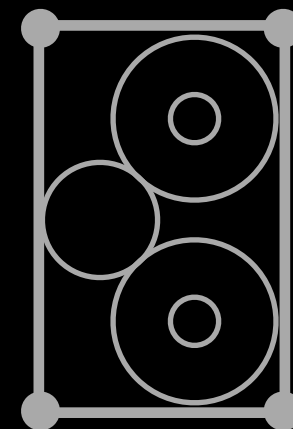


Dani



L

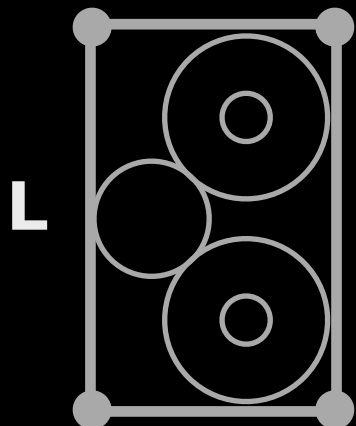
SKAA Speaker



R

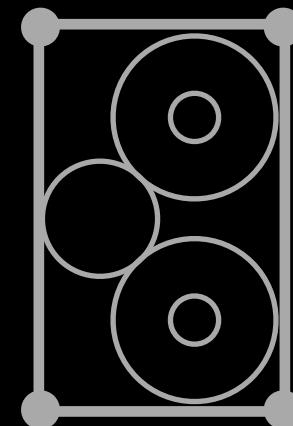
SKAA Speaker

SKAA Speaker



L

SKAA Speaker

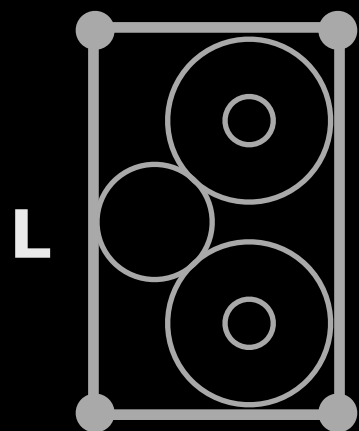


R

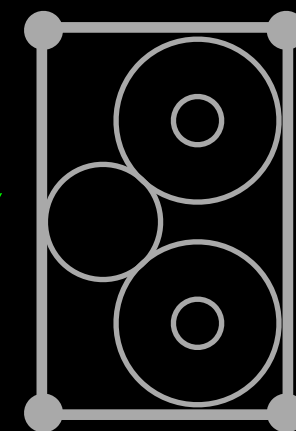
**Serious DJs will want to use a
mixer ...**

4

Hybrid Speaker DJ

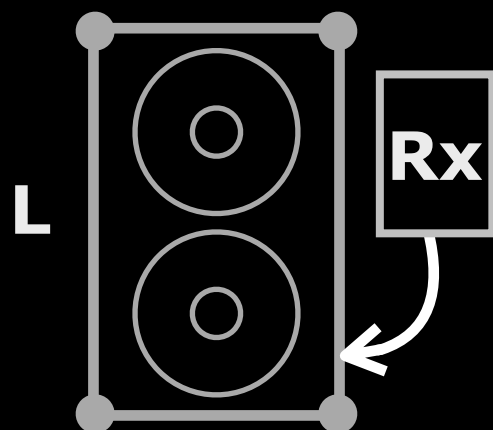


SKAA Speaker

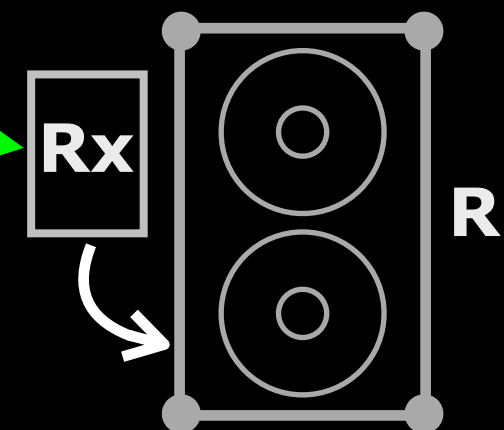


SKAA Speaker

Powered Speaker



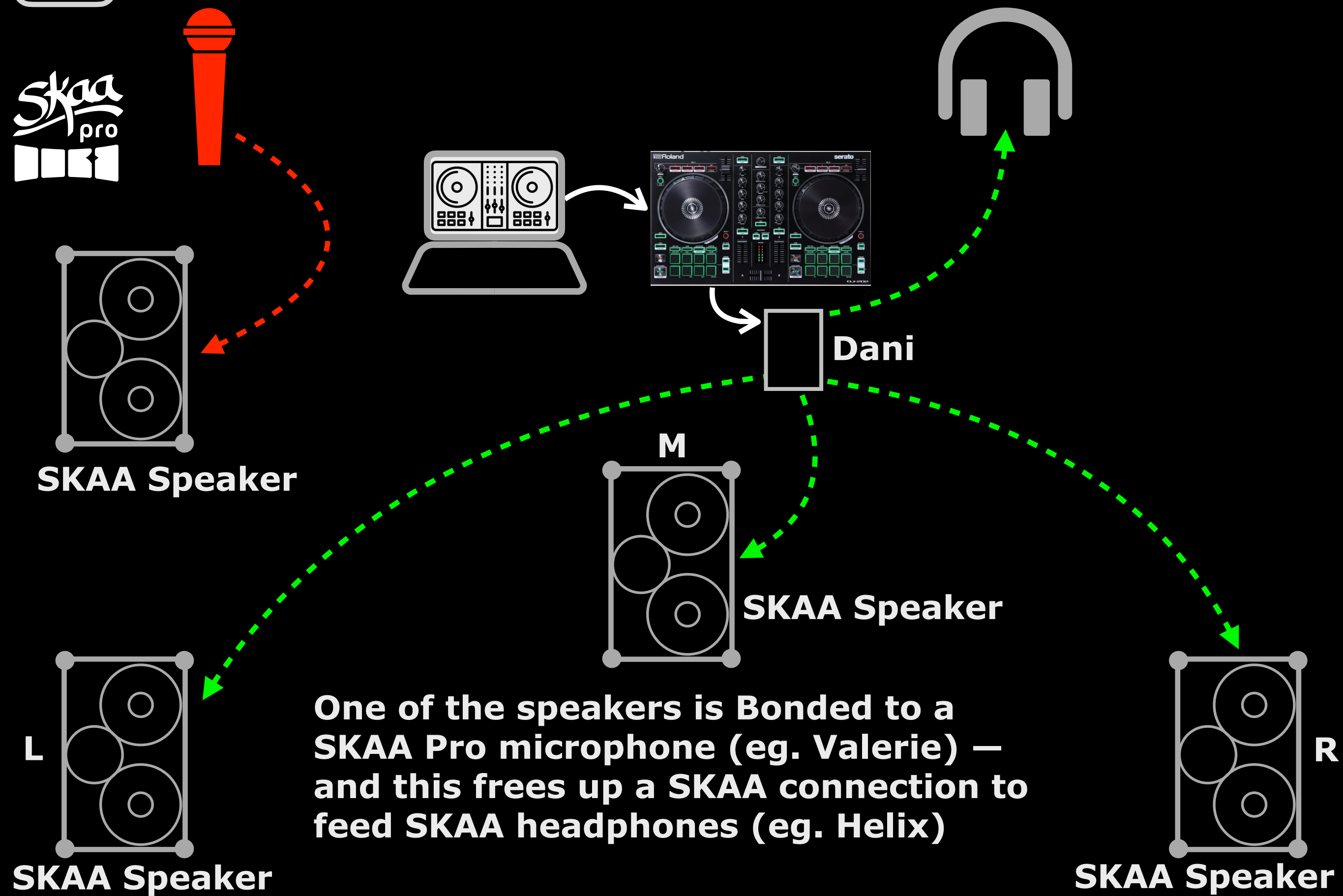
Powered Speaker



Not all powered speakers have SKAA built in, but SKAA receivers (eg. Rush) fix that problem

5

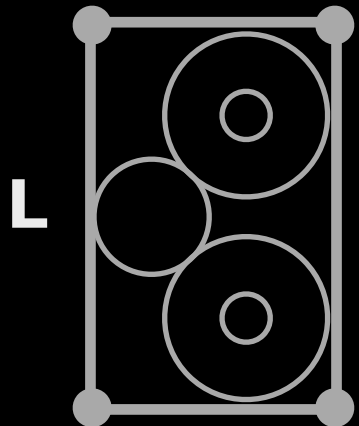
DJ with Mic & Headphones



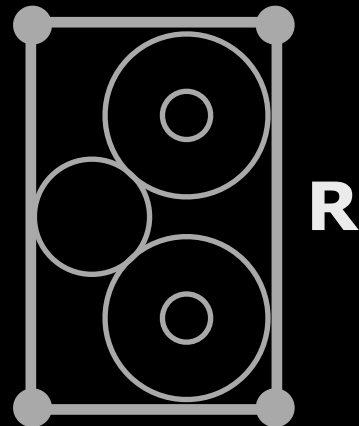


Dani

SKAA Speaker



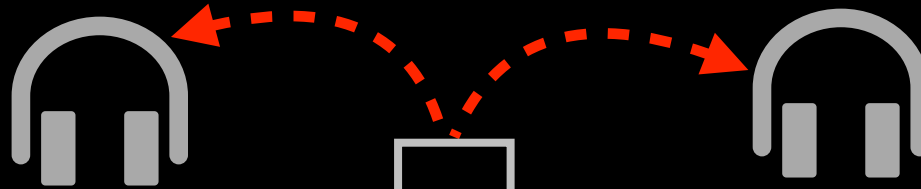
SKAA Speaker



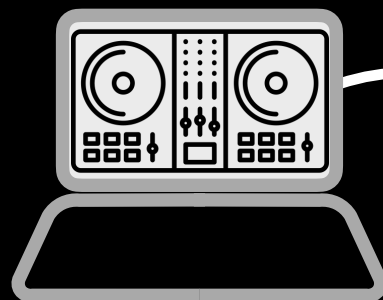
Lightning-fast scratching DJs will use
Dani's ultra-low-latency SKAA Pro mode
to feed the front of house

7

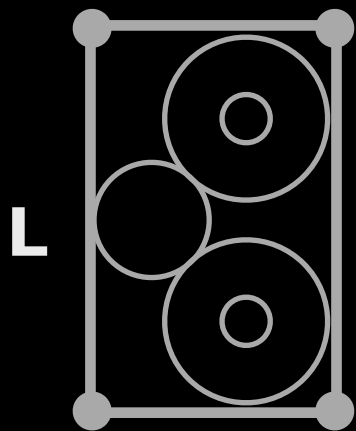
Low Latency DJ Headphones



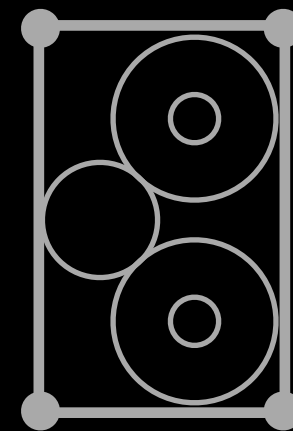
Dani



Dani

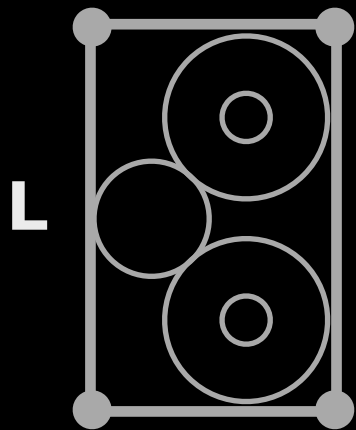


SKAA Speaker

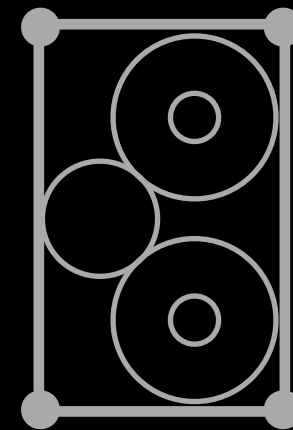


SKAA Speaker

SKAA Speaker

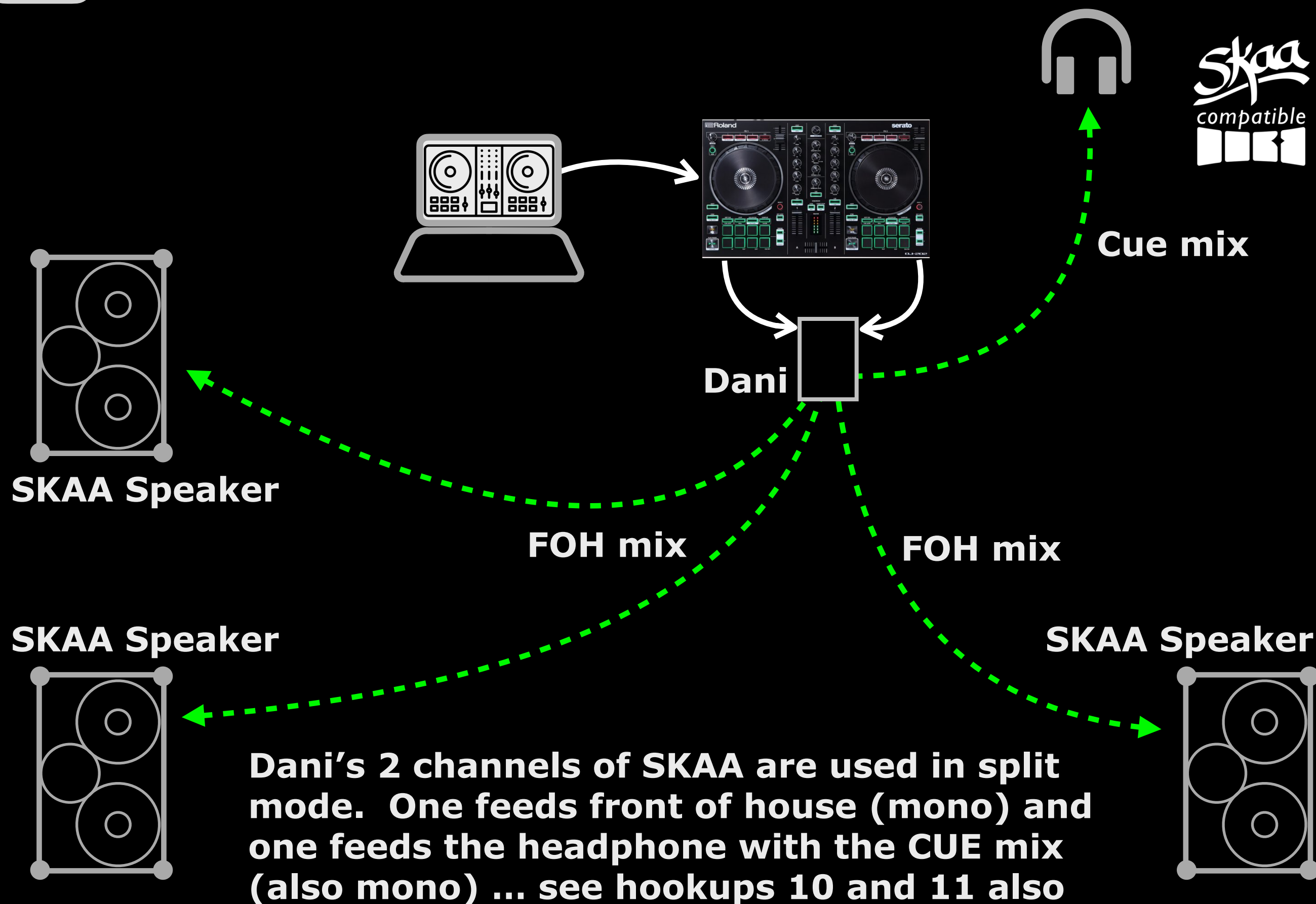


SKAA Speaker



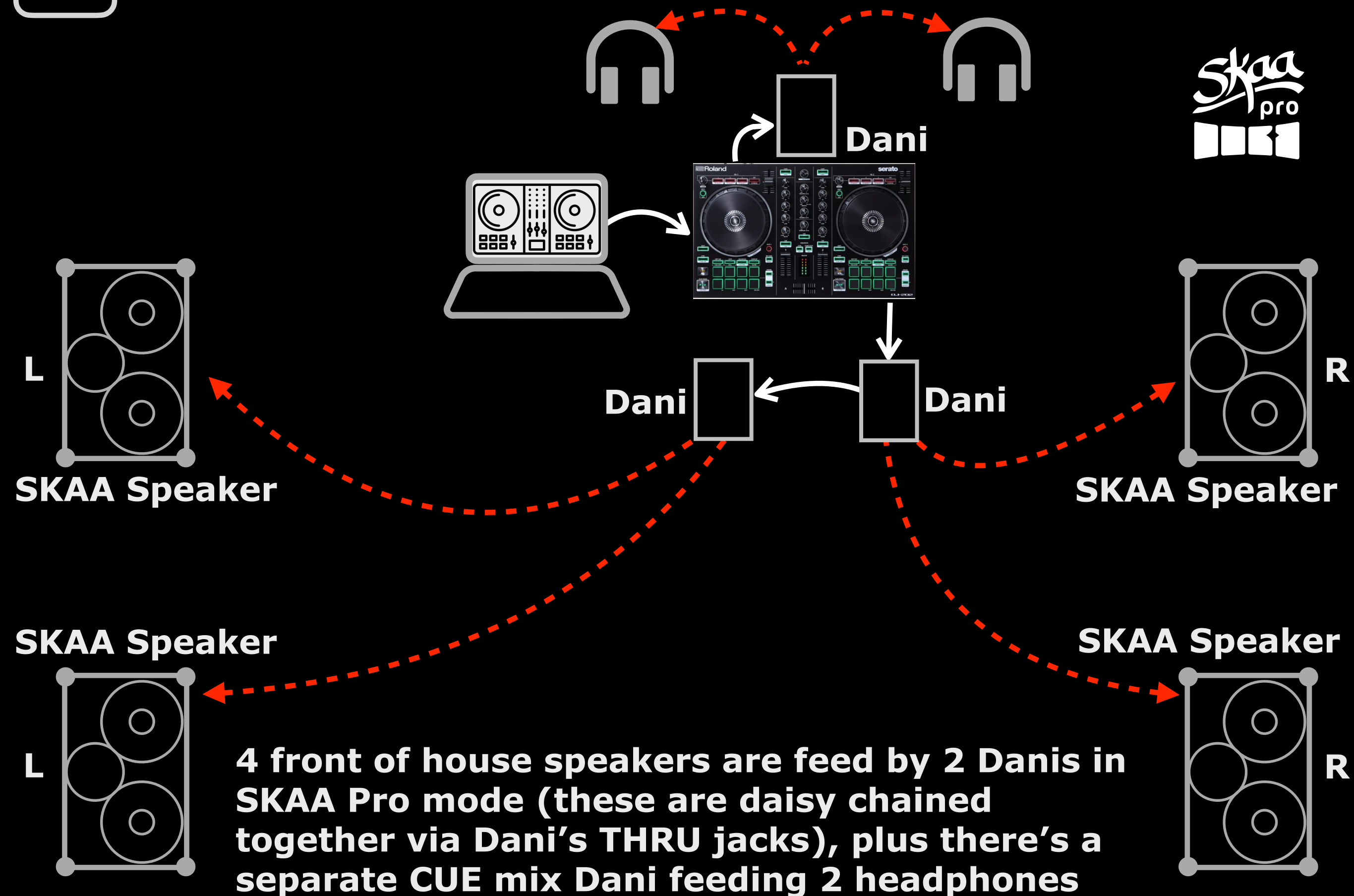
This DJ wants a separate low-latency CUE mix to headphones (up to 2) so he uses one Dani in SKAA Pro to feed the headphones and another one in SKAA mode to feed the front of house

Split Channel Mono DJ



9

Balls Out DJ





using Dani in split channel mode

XLR

main out (set to
mono in deck)

cable
XLR-F to
1/4" TRS



TRS

Dani

1 = FOH

2 = CUE

TS

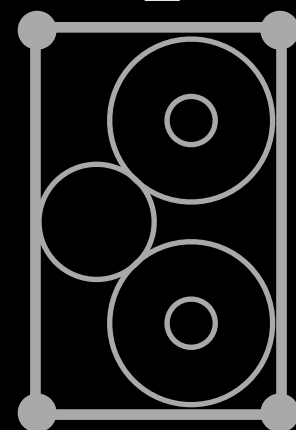
headphone out
(set to mono in
deck)

TRS

stereo to
L & R
splitter
cable

Leave one
end
unconnected

*L



SKAA Pro

*R



*R

* channel routing in
receiver set using
SKAA cmd app



using Dani in split channel mode

XLR

main out (set to
mono in deck)

cable
XLR-F to
1/4" TRS



headphone out
(set to mono in
deck)

TRS

stereo to
L & R
splitter
cable

one end
unconnected

TRS

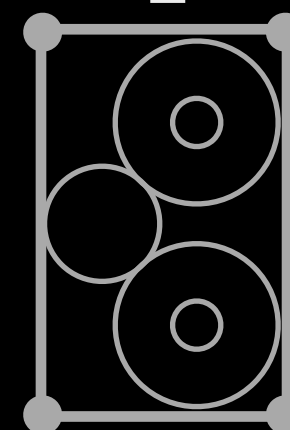
TS

Dani

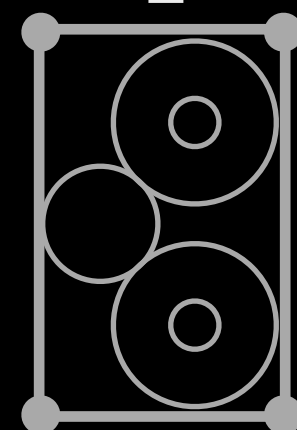
1 = FOH

2 = CUE

*L



*L



SKAA

*R



*R

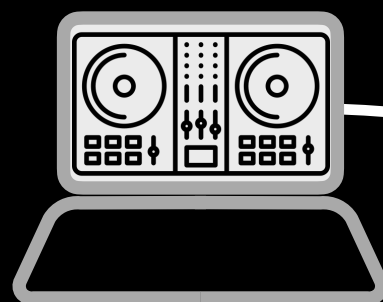
*R



*R

* channel routing in
receiver set using
SKAA cmd app

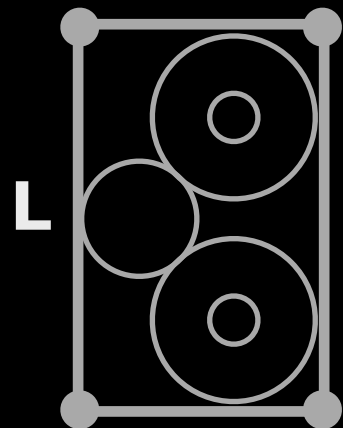
Passive Speakers



rack amp

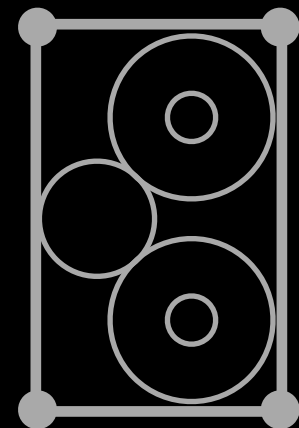
Dani

SKAA Speaker



L

SKAA Speaker



R

Dani's THRU jacks are used to pass the mixer's output to rack amplifiers which feed wired speakers — so for example, WIReD could be used for the front and WIRELESS for the rear of the room

CONGRATULATIONS !

**you've made it to the
end**

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or adapters?
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what you need !*



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